Space Weather Forecast

Issued on Monday, 19 August 2024 at 01:16 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Moderate class flares expected with a chance of Strong flares (X-class). Chance of G1 Minor Storms day 4 (22 Aug)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with four Moderate-class flares observed, the largest from the compact but complex sunspot region on the northwest disc. There are twelve sunspot regions on the disc, however the majority of the flare activity is from this region, This has an unusual north-south aligned mixed polarity spot, that has remained persistent, albeit perhaps weakening slightly. Some ongoing emergence and decay has been occurring in its peripheral spots however. Other notable regions include one near the southeast limb, which is is currently hard to assess due to its proximity to the limb, but has some apparent growth. Growth has also been observed in another region in the southeast, which is comprised of a number of small mature spots with some mixing of polarity within its intermediate region, and a further region in the north, although this maintains a simple bipolar configuration.

No Earth-directed coronal mass ejections (CMEs) were observed.

Solar Wind / Geomagnetic Activity: Weak CME effects at first, from the arrival on 17 Aug, gradually eased with slow wind conditions returning. Solar wind was initially slightly elevated at 450 km/s, declining after 18/1400 UTC to background, around 350-400km/s. Interplanetary Magnetic Field was initially Moderate but rose to give a brief Strong peak around 18/0830 UTC, before quickly returning to Moderate values with a gradual easing trend following. The north-south component was Weak to Moderately northward at first, before peaking around Strongly northward around 18/0830 UTC, then switched to be Moderately southward, then became weak and variable thereafter. Geomagnetic activity was Quiet to Unsettled (Kp 2-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) remained at background with no Solar Radiation Storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High activity expected with further occasional Moderate class flares, and a chance of isolated Strong (X-class) flares.

Solar Wind /Geomagnetic Activity: There are no Earth directed CMEs, however a CME off the north-disc on 17 Aug has a slight chance of giving a glancing arrival on day 3 (21 Aug). Otherwise mainly background winds are expected until the onset of any faster solar wind from a small coronal hole in the centre disc. This potentially occurring on day 4 (22 Aug), however confidence is low. Quiet geomagnetic activity expected with a slight chance of Unsettled intervals, but with a chance of increasing to Active to G1 Minor Storm with any coronal hole onset on day 4 (22 Aug). Any CME glance also brings a very slight chance of Active to G1 Minor Storms on day 3 (21 Aug).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is expected to persist at background, however any notable flares could increase the count rate towards the S1 Minor Solar Radiation Storm level, with a slight chance of exceeding

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it. These most likely from the complex sunspot region in the northwest.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	5	25
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	80	80	70
Very Active	R3 to R5 X	No	25	25	25	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	20	15
Very Active	≥ S3 *	No	5	5	5	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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